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Abstract Submitted for the 1997 Topical Conference
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Suggested titles of sessions in
which paper should be placed:

Detonation Physics & Energetic Materials {DE}

Chemical Reaction and Equilibration Mechanisms in Detonation Waves.* C. M. Tarver, Lawrence Livermore National Laboratory.--- Experimental and theoretical evidence for the nonequilibrium Zeldovich - von Neumann - Doring model of detonation is presented. High density, high temperature transition state theory is used to estimate the lifetimes of unreacted explosives behind the various wavelets comprising the detonation wave front. The subsequent exothermic chain reactions rapidly form highly vibrationally excited product molecules. The vibrational relaxation times of these products are calculated assuming that supercollisions, in which several quanta of vibrational energy can be transferred in a single collision, are important under these conditions. Comparisions are presented with experimental relaxation rates measured by laser interferometric and embedded gauge techniques. The physical mechanism by which vibrationally excited products amplify the leading shock front is discussed.

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Prefer Standard Session